

We claim:

1. In a radio communication system having a multiple-antenna transmitter that selectably transmits data at least from a first transmit antenna transducer and at least a second transmit antenna transducer for communication to a receiver, the data  
5 encoded at an encoder to include a systematic part and a non-systematic part, an improvement of apparatus for facilitating transmission of the data to the receiver, said apparatus comprising:

a determiner at least adapted to receive indications of channel conditions of each channel upon which data is transmitted by each of the first and at least second transmit  
10 antenna transducers, respectively, said determiner for determining at least relative channel qualities of each of the channels;

a data assignor coupled to said determiner to receive indications of determinations made thereat, said assignor for assigning the systematic part of the data encoded by the encoder to at least one of the first and at least second transmit antenna  
15 transducers that exhibits relatively better channel qualities.

2. The apparatus of claim 1 wherein the radio communication system comprises a multiple-input, multiple-output communication system, wherein the receiver comprises a first receive antenna transducer and at least a second receive antenna  
20 transducer, and wherein said determiner is at least adapted to receive indications of channel conditions on each channel formed between each of the first and at least second transmit antenna transducers and each of the first and at least second receive antenna transducers.

25 3. The apparatus of claim 1 wherein the indications of the channel conditions to which said determiner is adapted to receive comprise indications of aggregated energy levels of the data detected at the receiver.

4. The apparatus of claim 1 wherein the indications of the channel conditions to which said determiner is adapted to receive are provided to the transmitter by the receiver.

5 5. The apparatus of claim 1 wherein the encoder at which the data is encoded to include the systematic part comprises a turbo encoder.

6. The apparatus of claim 1 wherein the non-systematic part of the data encoded by the encoder comprises a parity part and wherein said data assignor further  
10 assigns the parity part of the data encoded by the encoder to at least an other of the at least one of the first and at least second transmit antenna transducers.

7. The apparatus of claim 6 wherein the other of the at least one of the first and at least second transmit antenna transducers to which said data assignor assigns the  
15 parity part of the data encoded by the data encoder exhibits relatively poorer channel qualities.

8. The apparatus of claim 7 wherein said data assignor assigns the systematic part to a selected number of the first and at least second transmit antenna transducers  
20 that exhibit the relatively better channel qualities and assigns the parity part to at least one remaining transmit antenna transducer.

9. The apparatus of claim 1 wherein the radio communication system comprises a cellular communication system operable generally pursuant to a cdma 2000  
25 operating specification and that provides for 1xEV-DV data communications and wherein the data encoded by the data encoder comprises 1xEV-DV data, the data assigned by said data assignor and transmitted from the first and at least second antenna transducers pursuant to effectuation of a 1xEV-DV data communication service.

10. The apparatus of claim 1 wherein the indications of the channel conditions to which said determiner is coupled to receive comprise antenna index values.

11. In the radio communication system of claim 1 wherein said determiner and said data assignor are embodied at the transmitter, a further improvement of apparatus for the receiver, also for facilitating transmission of the data to the receiver, said apparatus comprising:

a channel condition detector for detecting the channel conditions of each of the channels upon which the data is transmitted; and

a channel condition message generator, coupled to said channel condition detector, said channel condition message generator for generating channel condition message for communication by the receiver to the transmitter of detections made by said channel condition detector.

12. The apparatus of claim 11 wherein the channel conditions detected by said channel condition detector comprise indications of aggregated energy levels detected at the receiver.

13. The apparatus of claim 11 wherein the channel conditions detected by said channel condition detector comprise indications of antenna index values.

14. The apparatus of claim 11 wherein the transmitter at which said determiner and said data assignor are embodied comprise a base transceiver station operable in a cellular radio communication system and wherein the receiver at which said channel condition detector and said channel condition message generator are embodied at a mobile station operable in the cellular radio communication system.

15. In a method of communicating in a radio communication system having a multiple-antenna transmitter that selectably transmits data at least from a first transmit antenna transducer and at least a second transmit antenna transducer for communication

to a receiver, the data encoded at an encoder to include a systematic part and a non-systematic part, an improvement of a method for facilitating transmission of the data to the receiver, said method comprising:

determining at least relative channel qualities of each channel upon which data is transmitted by each of the first and at least second transmit antenna transducers; and  
assigning the systematic part of the data encoded by the encoder to at least one of the first and at least second transmit antenna transducers that exhibits relatively better channel qualities.

16. The method of claim 15 further comprising the operation, prior to said operation of determining, of detecting channel conditions of each of the channels upon which the data is transmitted, the at least the relative channel qualities determined during said operation of determining determined responsive to detections made during said operation of detecting.

17. The method of claim 16 wherein said operations of determining and assigning are performed at the transmitter and wherein said operation of detecting is performed at the receiver.

18. The method of claim 17 further comprising the operation of sending values representative of the channel conditions to the transmitter.

19. The method of claim 18 further comprising the operation, prior to said operation of sending, of forming a message containing the values representative of the channel conditions and wherein said operation of sending comprises sending the message formed during said operation of forming.

20. The method of claim 16 wherein detections made during said operation of detecting comprise aggregate energy levels received at the receiver.